

What is claimed is:

1. A bead alignment structure wherein a plurality of beads are aligned one- or two-dimensionally and the beads are bonded to and integrated with each other while retaining the alignment.
2. A method for producing an integrated bead alignment structure comprising the steps of: aligning a plurality of beads one- or two-dimensionally outside a capillary; and bonding the plurality of beads to each other while the bead alignment is retained.
3. The method for producing a bead alignment structure according to claim 2, wherein the plurality of beads are aligned one- or two-dimensionally in a predetermined and desired order.
4. The method for producing a bead alignment structure according to claim 2, further comprising the steps of: dispensing the plurality of beads into a liquid pool outside the capillary having a depth that is almost the same length as the particle diameter of a bead; removing excessive beads that the liquid pool cannot contain by leveling the excessive beads by moving a leveling member which is in contact with and relatively capable of being moved to the liquid pool; and filling and aligning the beads in the liquid pool one- or two-dimensionally.
5. The method for producing a bead alignment structure according to claim 2, further comprising the steps of:
  - adding dropwise or spraying a solution containing a photo-polymerization compound and a photo-polymerization initiator to the liquid pool having the plurality of beads aligned one- or two-dimensionally; and radiating an exciting light to the vicinity of contact points of adjacent individual beads to polymerize the photo-polymerization compound; or
  - adding dropwise or spraying a solution containing a polymerization compound and a polymerization initiator to the liquid pool having the plurality of beads aligned one- or two-dimensionally; and heating the liquid pool to polymerize the

polymerization compound; and

thereby bonding adjacent beads so that an integrated bead alignment structure comprising a plurality of beads retaining the one- or two-dimensional alignment is produced.

6. The method for producing a bead alignment structure according to claim 2, wherein when the plurality of beads are made of plastic, the vicinity of contact points of individual beads is temporarily melted by radiating laser light thereto in the liquid pool having the plurality of beads aligned one- or two-dimensionally to bond the beads to adjacent ones, so that an integrated bead alignment structure comprising a plurality of beads retaining a one- or two-dimensional alignment is produced.

7. A bead alignment method for a capillary array having particulate beads aligned in a capillary, comprising the steps of: aligning the plurality of beads one- or two-dimensionally outside the capillary; producing a bead alignment structure having the plurality of beads bonded to and integrated with each other while retaining the bead alignment; disposing the bead alignment structure in the capillary; and introducing the beads comprising the plurality of beads retaining one- or two-dimensional alignment simultaneously into the capillary.

8. The bead alignment method for a capillary array according to claim 7, wherein the plurality of beads are aligned one- or two-dimensionally in a predetermined order.

9. The bead alignment method for a capillary bead array according to claim 7, further comprising the steps of: dispensing the plurality of beads to a liquid pool, outside the capillary, having a depth that is almost the same length as the particle diameter of a bead; removing excessive beads that the liquid pool cannot contain by leveling the excessive beads by moving a leveling member which is in contact with and relatively capable of being moved to the liquid pool; filling the beads in the liquid pool one- or two-dimensionally; and aligning the beads one- or two-dimensionally.

10. The bead alignment method for a capillary bead array according to claim 7, further

comprising the steps of:

adding dropwise or spraying a solution containing a photo-polymerization compound and a photo-polymerization initiator to the liquid pool having the plurality of beads aligned one- or two-dimensionally, and radiating an exciting light to the vicinity of contact points of adjacent individual beads to polymerize the photo-polymerization compound; or

adding dropwise or spraying a solution containing a polymerization compound and a polymerization initiator to the liquid pool having the plurality of beads aligned one- or two-dimensionally, and heating the liquid pool to polymerize the polymerization compound;

thereby bonding adjacent beads to each other, so that a bead alignment structure comprising a plurality of beads retaining a one- or two-dimensional alignment is produced.

11. The bead alignment method for a capillary bead array according to claim 7, wherein, when the beads are made of plastic, the vicinity of contact points of individual beads is temporarily melted by radiating a laser light thereto in a liquid pool having the plurality of beads aligned one- or two-dimensionally, and thereby adjacent beads are bonded to each other, so that a bead alignment structure comprising a plurality of beads retaining a one- or two-dimensional alignment is produced.

12. The bead alignment method for a capillary beads array according to claim 7, wherein the integrated bead alignment structure comprising a plurality of beads retaining a one- or two-dimensional alignment is removed from the liquid pool and disposed in the capillary, so that the beads comprising the plurality of beads retaining a one- or two-dimensional alignment are introduced into the capillary.